

Improving sanding and polishing with automation

Whether you are the founder of an enterprise that has had humble beginnings with labour intensive hand sanding or an established operation handed over from generation to generation, timing and the investment in effective technology has always been associated with leadership, sustainability and success.

By Bob Kory, Kory Dubay

Profile brush sanding with 22 brush sanding heads at 43m/min

One excellent example of success that has been achieved over the last four years is the Australian Moulding Company (AMC) located in Bayswater, Victoria. Hugh Gilchrist, Managing Director and owner of the company, showed me the recent changes to the company's automated pre-coating architrave and skirting line just after installing and commissioning his second

MPB built brush sanding machine that was engineered locally with a talented team and Hugh's direction. It features eight Flex-Trim brush sanding heads, and has been dedicated to sanding after coating. The result is a reputation of product excellence with a silky finish and great customer service.

The current layout has become far more streamlined, allowing the original profile sander with 14 Flex Trim brush sanding heads to be repositioned and dedicated solely to



raw sanding at a feed rate around 43 meters per minute. Recycling with one machine to do two jobs was very stressful but with the new layout there is significantly improved flow. The coating line is now shaping up to rival automated finishing lines in other parts of the world like Europe and Scandinavia.

This progression has taken time and Hugh and his production manager Peter Jones have advanced by trying various methods of paint and paint application as well as sanding procedures with the

disadvantage of processing both large and smaller custom jobs with which most of us in manufacturing here in Australia are familiar.

AMC's first step from the bottleneck of laborious hand sanding to the original single brush sanding drum and two discs resulted in the first dramatic increase of capacity to 5000 l/m per day with a noticeable improvement in consistency and quality. The challenge of doubling the capacity again required a substantial investment, the innovation came with the creation of a purpose built,



Paint Fusion's production manager Rocky Binci programming the Unisander fitted with 6 brush heads from Flex Trim for 3D panel sanding

multiple head brush sanding machine, which was built overseas to run at 43 min/m and needed eight discs and six overhead drums to keep up. The payback came fast with increased capacity to 10,000 l/m, and the point of difference being a further improvement in quality and delivery of the product.

The result was that demand for products continued to increase at 15-20% and that meant a new goal had to be set to maintain service. Doubling capacity again to

an output of 20,000 l/m required a further investment in another brush sanding machine. Raw moulded strips could now have unwanted fibre removed as it passed the dedicated sanding station immediately before paint application, and this follows the philosophy of Poul Jespersen from Flex Trim: "if you want glass then start with glass".

With the moulded strip now vacuum coated and dry it is transferred directly through the new eight head

post brush sanding machine giving it a very smooth finish as it heads directly to the packaging section. Peter once commented that life would have been a lot easier if the changes were made years ago, especially because some days it felt like nothing was being achieved due to the need to make two cycles to achieve one pass.

With great foresight AMC has gone from strength to strength. Their original choice of Flex-Trim brush sanding that conform easily to the moulded strips as part of their coating solution has allowed fast resetting, increased capacity, improved quality and service and the quality sanding strips also run for around three to four months before replacement.

3D brush sanding with Danish patented four directional sanding

A different approach was needed for Paint Fusion located in Dandenong, Victoria for the coating of panels such as architectural products, kitchen and bathroom doors and panels in both large or small custom runs. The vision of Chris Bardis and Andrew Mizzi for Paint Fusion didn't happen overnight – it has also been around four years. The goal was to be a leader in their field with quality and service with the capacity to process both flat or shaped panels efficiently to keep a tight turnaround time was a vital ingredient in the pursuit of their goal.

Sanding

Accepting that one particular sanding machine may not solve all the processing problems they might encounter to service their customers, Paint Fusion checked out all the equipment they required over time and then made their choices. It included flow-through brush sanding, calibration belt sanding and edge sanding. With this group of equipment now available to him and his co-workers on the shop floor, such as the Danish built Unisander, the finishing manager, Rocky Binci, has put together procedures that can now process various job lots efficiently through the equipment. The point of difference has been achieved with a huge improvement in quality and customer service.

Edge sanding with 2xbelt and 6xbrush sanding heads

This task has to be processed as a separate operation and can easily be automated with a flow through edge sander.

The Flex Trim Australia 6 meter long retro fitted edge sander, this one has 2 beltsanders 4 x Flex Trim 180mm brush sanding disc's plus 2 x 180mm brush sanding drums, with jumping head feature.



For a contract finishing operation it can be a bit of a nightmare because you don't have any control on the machining or substrate quality. The sanding solution has to cope with a number of problems that might be encountered, including the subtle changes of the MDF substrate itself such as density that effects machineability and paintability, poor machining such as cutter chatter marks or chips and deep saw vibration marks and sharp edges. Then, after all this has been conquered, edge spraying that leaves behind paint runs will need to be recalibrated and then fine sanded prior to finish coating.

The machine must be efficient enough to cope with all these possibilities and have a feed rate that is efficient to get all four edges through the first cycle, and must be easy to reset with enough sanding stations to have a smooth edge. With the list of stations including pre-milling, belt sanding, brush sanding with drum or disc, this can end up being a very long machine.

We have made a number of retro fitted edge sanders to



While the CNC router is precision cutting the next components, the manual Flex 100 brush sander is being used to edge sand the previous components by a CNC operator in Sweden. Ergonomically designed to allow the work-piece weight to rest on the table and the operator also does not have to grab hold of a pad sander all day, but simply push it past the brush head a number of times.

demonstrate the versatility of Flex Trim brush sanding heads only. That is fine where the MDF substrate is of a good density and the "off the tool finish" is excellent and does not require recalibration with a belt. However, where either or both the substrate and machining is only satisfactory, pre-milling and the belt sander is added to totally recalibrate the edge.

This approach for preparation sanding is not exclusive to painted surfaces – anything that can improve the bond and therefore heat resistance for thermo laminating is essential for a quality job, so sanding and smoothing the edge in this case improves adhesive application and greater surface contact after thermo laminating.

This latest Flex Trim retro fit is six meters long and has eight heads including two recycled belt sanding stations. This allows the versatility to sand the edge twice, if required, in one pass but the abrasive mineral on the sandpaper is only capable of taking off a few microns in

one pass. And, if the depth of the damage from poor machining is deeper than a few microns, then pre-milling may be recommended first with two heads and jumping heads to avoid break out. The Flex Trim brush sanding heads can take care of the rest like arising the edge, removing the nap and fine finishing with pairs of discs or drums running clockwise or counter clockwise for a smooth finish.

Gloss paint finish or Corian sanding and polishing

Another area that has been automated to improve quality and efficiency is calibration surface sanding without a belt but with an orbital sanding pad.

Cutting and polishing can recover plain faced



Left: A single head Gottschild sander and polishing machine with 1200mm working width with infeed and outfeed conveyors. Above: A twin bridge-twin head machine with cross oscillation that can halve processing time on larger panels.

gloss two pack painted surfaces that may have surface contamination and paint splatter, which is usually repaired with some manual spot sanding and laborious hand polishing and represents significant reworking cost. It is now possible to automate this area with a very specialised Gottschild machine that automates orbital sanding and polishing operations with its unique automatic part size recognition – so simply feeding in the random panel sizes at random is possible and the machine takes care of the rest making it very easy to use.

The Gottschild machine is built in Germany and has been designed to maintain the selected parameters like speeds, feed and increment rates, overhang and

pressure for either sanding or polishing this results in consistency of finish in each batch.

This technology is also being used in Europe to sand and then polish prefabricated Corian components. It also can be used to sand or clean overspray on the back of both painted parts and adhesive overspray from the backs of thermo laminated products after trimming. Gottschild also has automatic trimming.

A demonstration machine is scheduled to arrive at Gottschild Australia, located at Sunshine, Victoria, in April this year, and will also be demonstrated in the upcoming Australian Woodworking and Technology Exhibition in the Melbourne Exhibition Centre from 28 to 30 July, 2011. ●